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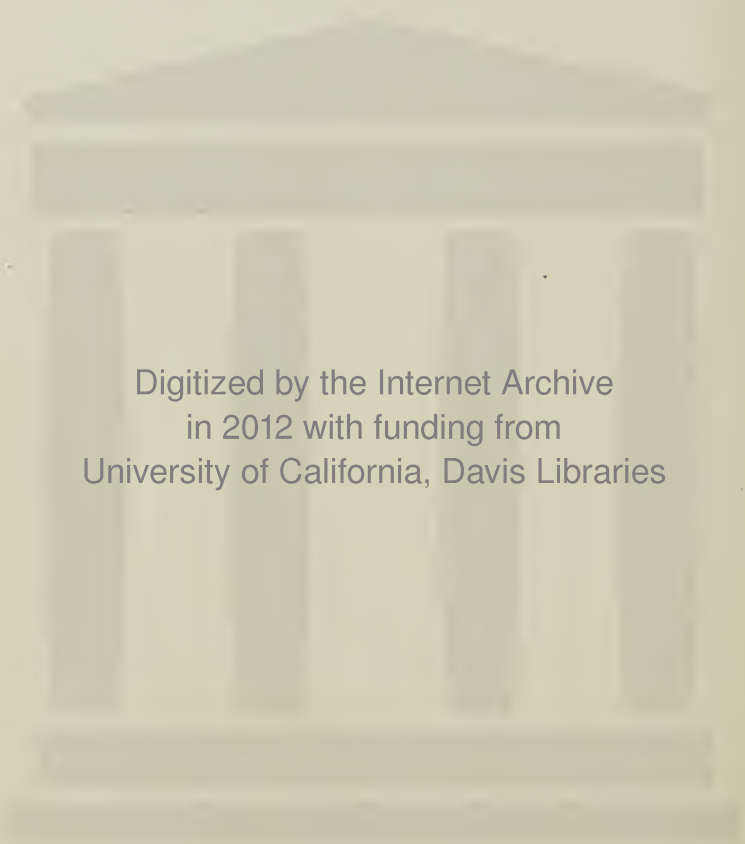
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# GRAFTING AFFINITIES WITH SPECIAL REFERENCE TO PLUMS

MYER J. HEPPNER<sup>1</sup> AND ROY D. MCCALLUM<sup>2</sup>

No deciduous fruit in California has been grafted and regrafted more than the plum including both Japanese<sup>3</sup> (*Prunus salicina*) and European (*Prunus domestica*) varieties. This is especially true in the Sierra foothill region and in the Vaca Valley section, two of the largest plum growing districts in the state. Several factors have been responsible for this practice. Of chief importance has been the effort to reduce the number of varieties and eliminate the mediocre ones which for years have seriously affected market prices for plums.

During the 1924 Placer County Fruit Growers' Convention, a committee<sup>4</sup> appointed to select the varieties of plums best suited to the Sierra foothill region recommended 17 out of the 55 varieties then being grown. The report of this committee summarized in the form of a score card follows:

Variety	Size	Yield	Color	Tree growth	Selling price	Shipping quality	TOTAL
<i>Perfect score</i> .....	20%	20%	10%	10%	30%	10%	100%
Wickson.....	20	18	5	8	30	10	91
Kelsey.....	20	18	5	7	30	10	90
President.....	18	15	10	6	30	10	89
Gaviota.....	20	18	5	7	27	10	87
Grand Duke.....	15	14	10	8	27	10	84
Duarte.....	15	20	7	10	23	7	82
Climax.....	17	20	7	5	23	10	82
Beauty.....	10	20	7	10	23	10	80
Formosa.....	20	5	5	10	30	10	80
Burbank.....	13	20	7	10	20	10	80
Santa Rosa.....	15	13	7	10	25	8	78
Hungarian.....	18	14	7	8	20	8	75
Giant.....	14	20	7	6	18	9	74
Tragedy.....	8	5	10	10	27	10	70
Satsuma.....	12	10	7	10	20	10	69
Diamond.....	12	13	10	7	15	8	65
California Blue.....	12	10	10	3	20	8	63

In order to concentrate upon these relatively few varieties, many growers have been grafting over some of the weaker ones. This fact has probably accounted for most of the plum grafting done in recent

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<sup>3</sup> Throughout the text the term Japanese varieties will refer to true Japanese varieties and their hybrids.

<sup>4</sup> Committee members: J. W. Barnicott, J. H. Andregg, J. E. Van Riper, J. A. Teagarden, J. J. Brennan, Lee Rippey, C. K. Turner, and R. D. McCallum.

years. Moreover, some varieties have proved unsuitable for one reason or another, to certain sections. Rather than remove the trees entirely, many growers have resorted to grafting in order to secure varieties which are better adapted to their particular conditions.

Top-working for pollination purposes constitutes a third important factor in accounting for the large amount of this grafting. Cross pollination is of prime importance for the setting of fruit in practically all plum varieties. It has been necessary, therefore, to introduce an additional variety into orchards which were at one time solid blocks of one variety. This is being done by grafting-over established trees with the proper pollinizing variety.

The three factors mentioned above, as being instrumental in causing the large amount of grafting that has been practiced with plums—first, to decrease the number of varieties; second, to secure varieties better adapted to certain localities, and third, to bring about cross-pollination—have brought to light a great deal of information regarding affinities existing not only among different plum varieties but also between plums and other species of deciduous fruits.

Realizing the importance of a knowledge of plum affinities to the grower contemplating a change in variety for one reason or another, it was thought advisable to bring together all available information on the subject. Experiments, the results of which are not ready for publication, are now under way at the College of Agriculture, Davis, to determine this question in a quantitative manner. At present, there are no published data relative to California varieties.

The information contained in this bulletin is not primarily the results of experiments carried on by the writers but is a summary of several years observations made by them in plum orchards in all sections of the state and is supplemented by data gathered from individual growers who have experimented with plum grafting for pollination or other purposes. In many cases, it was possible to locate large numbers of the same combination of varieties in several sections of the state. In others, however, it was possible to locate only one or two trees of a given combination in one section. However, the latter were generally deemed of sufficient importance to be included in this report.

In some instances the findings may be contradictory, because of many variable factors. The data in some cases may not be in accord with the findings of certain individuals but this is to be expected on account of the many variable factors such as tree age, vigor, soil, and moisture conditions, that enter into grafting. At best, the data presented can be but a guide to the prospective fruit tree grafter in showing him the possibilities of a successful graft union and ultimate new

top. Obviously, it has been impossible to cover the entire field. No doubt many growers have had experiences with plum grafting that would be of much value in a publication such as this. It is hoped that such individuals will inform the writers of these observations so they may be incorporated in later reports.

The data presented here refer to cases where grafting has been practiced in main frame-work branches in both young and old trees. It does not refer to nursery budding or grafting. In view of the fact that many varieties have not been worked over until recent years, it is impossible to draw definite conclusions in all cases. Budding in the nursery row and grafting in the frame-work branches or trunk sometimes bring opposite results. For example, the Diamond plum when budded in the nursery row on peach root frequently makes a brittle union, causing considerable breakage during the earlier years in the orchard. When grafted into the scaffold branches of peach trees, however, only a small amount of breakage occurs, despite the fact that the union is enlarged. Those branches which survive the first few years always make a satisfactory top.

A bad constriction often appears at the point of union. Frequently, this does not seem to have any deleterious effect upon the growth of the scion or the production of fruit. Unless actual breakage occurs between stock and scion, reports will be given in some instances where congeniality apparently exists between a given pair of varieties. Further, although a certain variety as a scion may stick to the stock for a number of years, it cannot be classed as a commercial success unless good production is secured.

In presenting the data, each variety will be considered separately and the behavior of the various other varieties when top-worked on it will be discussed. The data in condensed form will be found at the end of this publication.

#### BEHAVIOR OF VARIOUS PLUM VARIETIES AS STOCKS

*Apex.*—The Apex plum has been worked over to many other varieties. Those which appear to do well on it are Beauty, Burbank, Climax, Duarte, Formosa, Santa Rosa, and Satsuma. On the other hand, three varieties seem to give successful results in some cases and failure in others; namely, Gaviota, Kelsey, and Wickson. In view of these results, placing these varieties on Apex is questionable. All of the varieties mentioned above belong to the class known as the Japanese plums and seem to segregate themselves into two groups, one including the varieties which will do well when grafted on Apex,



and the other including those varieties which give uncertain results when used as the scion.

Many attempts have been made to get the European plums to grow on the Apex. Of the many varieties used, all have given negative results. The newly set scions often start out vigorously in growth but soon fail to increase much in size. The European varieties which have acted in this manner are California Blue, Clyman, Diamond, French prune, Giant, Grand Duke, Hungarian, President, Sugar, prune, Tragedy, Quackenboss, Imperial prune, Robe de Sergeant, and Standard prune.

From the foregoing statements, it is apparent that the Apex will probably unite well with most of the common Japanese varieties excluding Gaviota, Kelsey and Wickson, but seems to lack affinity for all the European plums which have been tried on it, including shipping and drying varieties.

*Beauty*.—What has already been stated regarding the behavior of the various Japanese and European plums on Apex can be repeated for the Beauty as a stock. However, while three Japanese varieties were mentioned as giving questionable results when grafted on Apex—namely, Wickson, Kelsey, and Gaviota—a fourth, the Burbank, can be added to the list for Beauty. Apparently, this variety will grow well on the Beauty under a certain set of conditions, but will not do well under another.

After a year's thrifty growth on the Beauty, the Burton prune seems to be showing less vigor during the second season. It appears as though fruit wood is being formed at the expense of wood growth. This variety will doubtless fall into the same category as the rest of the European types.

*Burbank*.—This variety appears to be an unsatisfactory stock. Although many attempts have been made to top-work the Burbank, the only plums that have proved satisfactory in this respect are the following Japanese varieties: Apex, Beauty, Duarte, Santa Rosa, Satsuma, Formosa, and Wickson, the last two giving questionable results in a few cases. The Burton prune and all of the European varieties mentioned as failures when tried on Apex have given poor results on the Burbank also.

*Burton Prune*.—Owing to the fact that this variety is of recent introduction into California, no data as to the behavior of other varieties on it are available.

*California Blue (Vacaville)*.—Although other plum varieties, including Japanese and European, have been grafted frequently on this plum in both the Vacaville and foothill regions, experience has

shown it to be an unsatisfactory stock for nearly every plum. Despite the fact that the newly set scion will often start growth, it apparently is not compatible with the California Blue stock and soon commences to show weakness in vigor, eventually ceasing growth, and dying. Of twenty-five or more commercial varieties tried with it, none has been successful. From this it is evidently safe to conclude that no plum should be grafted on the California Blue.

*Climax*.—With the exception of the Burbank, which makes a doubtful union, the Climax seems to make a satisfactory stock for practically all Japanese plums, including Apex, Beauty, Climax, Duarte, Formosa, Gaviota, Kelsey, Santa Rosa, Satsuma, and Wickson. The Climax, on the other hand, has proved unsatisfactory for all of the European plums which have been worked on it, including all the varieties mentioned above as having been grafted on the Apex. Although many of the plums in this class will unit and stick to the Climax for several years, the growth made is far from that required to set a good crop. For instance, Tragedy on the Climax has made but about four feet of growth in as many years.

*Clyman*.—This variety is a satisfactory stock for all Japanese and European plums grafted on it, except the California Blue. Because of its compatibility, and of its suitability for both stock and scion, it is frequently used as an intermediate stock in those cases where a direct union is impossible between certain varieties (fig. 1). Those varieties which have made compatible unions with the Clyman include the following Japanese plums: Apex, Beauty, Burbank, Climax, Duarte, Formosa, Gaviota, Kelsey, Santa Rosa, Satsuma and Wickson, and the European plums Diamond, French prune, Giant, Grand Duke, Hungarian, President, Sugar prune, Tragedy, Quackenboss, Imperial prune, Robe de Sergeant prune and Standard prune. The President makes a slow growth during the first season.

*Diamond*.—The Diamond, like the Clyman, lends itself to top-working with other varieties. In addition to the varieties listed as successful on the Clyman, the Burton prune should be added as also being successful on Diamond. Here again, the only plum variety which does not seem to do well on it is the California Blue. The Diamond has one drawback, however; the bark is thick, especially on old trees and is sometimes difficult to graft, forming a poor union. With old trees, success can be secured by cutting back severely into old wood and then grafting into the new growth during the following winter season. This cutting is generally done about five feet from the ground with trees around twelve years of age. With older trees, however, the cuts are generally made higher up.

*Duarte*.—This variety is one on which but few plums do well. Twenty-five plum varieties are known to have been tried on it, only six being successful: Apex, Beauty, Climax, Formosa, Santa Rosa, and Satsuma, all of them Japanese types. Other Japanese varieties such as Gaviota, Kelsey and Wickson appear to make a good union, but the tops make little growth and lack vigor and production. The



Fig. 1.—A tree made up of peach root, Clyman plum as intermediate stock and Grand Duke plum as top. The Clyman finds much use as a stock for such purposes where certain varieties cannot be worked directly on other varieties or species. The Grand Duke top is entering the third season's growth.



Burbank falls into the questionable class, making a good growth on some occasions but only mediocre progress on others. Evidently, none of the European types will make a good union with the Duarte as the stock, if one judges from the behavior of some fourteen varieties which have been grafted on it.



Fig. 2.—Formosa grafted over to Kelsey. Tree making excellent growth and producing splendid crops.

*Formosa*.—On the *Formosa*, all of the common Japanese varieties except Santa Rosa and Wickson appear to do well (fig. 2). Observations have shown these two to behave peculiarly. In some cases, the new tops are satisfactory, while in others the scions make but little

growth. Most of the European varieties which have been tried on Formosa appear to make a satisfactory union during the early life of the graft, but the tops soon become dwarfed (fig. 3), are short-lived



Fig. 3.—Diamond on Formosa. A small weak top after making six years' growth. A poor commercial tree.

and set little fruit, the latter generally maturing about a week to ten days earlier than normal. This characteristic of early maturing is especially pronounced on California Blue, Diamond, Grand Duke,



and President and is of course an advantage. Unfortunately, however, the European top eventually proves to be unsatisfactory since it lacks affinity with the Japanese stock. It is impossible to state how successful the Burton prune will prove on Formosa. Two-year-old grafts, the oldest found, are making an excellent growth, though the union does not seem to be secure. In the light of this fact, it is probable that the Burton will fall into the same category as other European varieties for top-working the Formosa.

*French Prune.*—The success attained in grafting some twenty-five varieties of plums on the French prune indicates congeniality of this stock with all the common plums, both Japanese and European types, except possibly the California Blue. In fact, some have used the French prune as an intermediate stock between varieties which do not unite directly. The Japanese varieties successful on the French prune are Apex, Beauty, Climax, Duarte, Formosa, Gaviota, Kelsey, Santa Rosa, Satsuma and Wickson; the European varieties, Burton prune, Clyman, Diamond, Giant, Grand Duke, Hungarian, President, Sugar prune, Tragedy, Quackenboss, Imperial prune, Robe de Sergeant prune and Standard.

*Gaviota.*—Of all the Japanese varieties of plums which have been grafted on the Gaviota only the Kelsey seems questionable for commercial success. The others, including Apex, Beauty, Climax, Duarte, Formosa, Santa Rosa and Wickson, appear to give good results. How the Burbank would behave on Gaviota cannot be stated, since it was impossible to locate this combination. Although some fourteen European varieties have been grafted on the Gaviota, none can be considered a success. It does not appear safe, therefore, to attempt to change the Gaviota plum over to any European type.

*Giant.*—What has already been stated about the French prune as a stock applies equally as well to the Giant. All varieties tried on it have been successful except California Blue, which is apparently the only variety not congenial with it. The Giant has shown itself to be a good all-around stock for grafting purposes. It will unite well with all the varieties presented under the discussion of the French prune as a stock.

*Grand Duke.*—Although the bark on old Grand Duke trees is a little harder to work, the two varieties, Grand Duke and Giant, fall into the same class for grafting purposes. With the exception of the President all varieties listed as successful on the Giant may be used to equal advantage on the Grand Duke.

*Hungarian.*—A discussion of this variety as a grafting stock is unnecessary, because it behaves similarly to the Grand Duke and

Giant as discussed above. However, as was the case with the Grand Duke as a stock, there seems to be some question as to the advisability of working the President on it. Good results have been secured in some cases and only a mediocre outcome in others. In the latter case, the union is poor and the graft short-lived. All other varieties appear to be doing satisfactorily on the Hungarian, excluding, of course, the California Blue, the behavior of which on other varieties has already been mentioned.

*Kelsey.*—All of the common Japanese varieties have given good results on the Kelsey with one possible exception—namely, the Burbank. This variety apparently is less safe to use than the other Japanese plums, for it makes a short, slow growth. Of the European varieties tried on Kelsey, all have been failures. It does not seem safe, therefore, to attempt to grow any European type of plums on the Japanese variety Kelsey.

*President.*—Little need be said of this variety as a stock for other plums. Save the California Blue, all plums tried on it have been successful, the list including practically all of the important varieties.

*Quackenboss.*—The few varieties of plums that have been grafted on Quackenboss have given satisfactory results. Among the Japanese types, Apex, Beauty, Burbank, Climax, Duarte, Formosa, Gaviota, Kelsey, and Santa Rosa have proved successful; among the European, Hungarian, Imperial prune and Robe de Sergeant prune. The behavior of President on Quackenboss is questionable, some growers getting good results and others not.

*Imperial and Robe De Sergeant Prunes.*—Additional observations must be made before it is possible to give definite data regarding the behavior of other plums on these two varieties.

*Santa Rosa.*—The Kelsey is the only Japanese plum which cannot be classed as doing well on the Santa Rosa. Although it is not a total failure, the Kelsey generally lacks in vigor when growing on Santa Rosa. Many European varieties have been tried on the Santa Rosa, all of which have responded poorly, growth and fruitfulness considered. From the fact that California Blue, Clyman, Diamond, French prune, Giant, Grand Duke, Hungarian, President, Sugar prune, Tragedy, Quackenboss, Imperial prune, Robe de Sergeant prune and Standard prune have all been given a trial on Santa Rosa and have offered little in the way of a new top, it appears as though the Santa Rosa should not be worked over to any of the European types.

*Satsuma.* Since the behavior of the plum varieties is exactly the same on Satsuma and Santa Rosa, nothing additional need be said regarding the former for stock purposes.



*Standard.*—This variety has not as yet been worked over to many other plums. All varieties that have been used for such purposes, however, have given satisfactory results. Apex, Beauty, Duarte, Formosa, Gaviota, and Santa Rosa are the Japanese varieties which have been tried, while French prune, President, Sugar prune, Imperial prune, Robe de Sergeant prune, Burton prune, and Quackenboss make up the European plum list. The President makes a somewhat bulky union and the growth is not as satisfactory as that made by some of the other varieties.

*Sugar Prune.*—This variety has shown itself to be a good all-around stock for all plums except California Blue, which is unsatisfactory on it. In fact, the discussion given under the French prune as a stock applies equally well to the Sugar prune.

*Tragedy.*—Tragedy has made a good union with all plums tried on it except the California Blue, especially if grafted over while the tree was young. Old trees have presented some difficulty because of the thick bark. On the Tragedy, as on the French and Sugar prunes both Japanese and European plums do well.

*Wickson.*—Most of the common Japanese varieties of plums have been grafted on Wickson, all of them evidently giving satisfactory results except the Kelsey, which is more or less unreliable in its behavior. Apex, Beauty, Climax, Duarte, Formosa, Gaviota, Santa Rosa and Satsuma are among those varieties which adapt themselves well to the Wickson stock. It is not safe, however, to graft any of the European types on Wickson, for not a single one of the many varieties that have been tried has proved successful.

*Peaches as Stock for Plums.*—The peach forms a satisfactory stock for all Japanese varieties of plums except the Climax and is commonly so used in the lighter soils. The following European varieties apparently make a good union and satisfactory growth when top-worked on most peaches, although the unions with certain peach seedlings may sometimes be questionable: French prune, Giant, Hungarian, President, Tragedy, Quackenboss. President on Lovell peach has given poor results. The Grand Duke should be added to the above list even though many have often recommended against grafting this combination (fig. 4). The plum top seems to grow much faster than the peach stock, forming a bad constriction at the union, but the vigor and production of this variety is generally satisfactory. This is true even though a small amount of breakage may often occur during the early life of some of the grafts. Breakage, however, does not always occur, for there is a large orchard near Penryn which consists of Giants and Grand Dukes grafted to peach seedlings. A single branch

has yet to break at the union of either of these varieties with the peach, despite the fact that the grafts are several years of age. In practically every case, the diameter of the Grand Duke scion directly



Fig. 4.—Peach seedling grafted over to Grand Duke. Although the plum is outgrowing the peach, the trees in the orchard are making splendid growth and producing excellent crops. Notwithstanding the constriction at the union, no breakage has occurred on any of the trees.

above the union is nearly twice that of the peach stock directly below it. The Giant, on the other hand, has made a perfect union with the peach, there being no constriction. The Diamond has been grafted

on peach to quite an extent, but the union is somewhat brittle for a few years and a small amount of breakage generally occurs. However, those grafts which survive the first few years make a splendid growth and form a satisfactory top. This is not always the case with nursery budded trees. Here considerable breakage frequently occurs.

What has just been stated regarding the type of growth made by the Grand Duke on peach seedling applies equally to the Burton prune. Though this variety outgrows the peach stock, there is practically no loss from breakage at the union.

The external appearance of the union made by California Blue on peach appears satisfactory, but the plum often dies back from the tip, thus indicating possible lack of congeniality between the plum top and peach stock.

Most of the prunes, other than French and Burton, including Imperial, Robe de Sergeant, and Sugar, fail to make successful unions when worked on peaches. It appears as though certain varieties of peaches are successful but others not satisfactory. Before definite recommendation regarding the best varieties for such purposes can be made, additional observations will be necessary.

In view of the fact that some plums cannot be worked directly on the peach, many growers have practiced double-working, placing a plum variety such as Clyman, on the peach to serve as intermediate stock. Many such instances are giving satisfactory results in the Sierra foothill region.

*Myrobalan Plum as Plum Stock.*—Though this stock is generally used in the nursery for plum propagation, it has been used to a slight extent only for top-working purposes. Excepting the Robe de Sergeant prune, for which it is quite difficult to find a satisfactory stock, the Myrobalan has proved a success with all varieties that have been worked on it.

*Almonds as Plum Stock.*—Some plums appear to do well on the almond, while others do not. As far as can be learned, those plums that have been tried and that appear to be satisfactory are Apex, Duarte, and Formosa among the Japanese varieties, and Clyman, French prune, Hungarian, President, Sugar, Tragedy, and Standard among the European types. It is questionable whether or not the Sugar should be included in the list above because of some results secured in the Winters section, where this variety was grafted on Eureka, Ne Plus Ultra, Nonpareil, Drake, Peerless, and I.X.L. almonds. Practically all of the grafts on the last four varieties died within three years. On the other hand, those on Eureka and Ne Plus Ultra were still in good condition after growing seven years.



Grafting Burbank, Burton, Climax, California Blue, Diamond, Gaviota, Kelsey, Santa Rosa, Wickson, Imperial and Robe de Sergeant on almonds is still questionable (fig. 5). With additional observations, however, it may be possible to class some of these as safe, for many of them have given very good results under certain conditions. The California Blue and Robe de Sergeant, however, appear to be total failures.



Fig. 5.—On certain types of almonds the Burton prune does not make a perfect union as this illustration indicates.

Splendid results have been secured with the Burton prune on Texas almond. Where this plum has been grafted on a miscellaneous collection of almond seedlings, however, about 25 per cent made perfect, 50 per cent fairly good, 20 per cent indifferent, and 5 per cent poor unions.



As far as the observations have been carried, it appears that some plum varieties can be worked successfully on only certain varieties or types of almonds.

*Apricots as Plum Stock.*—Many attempts, most of which have ended in failures, have been made to graft plums on apricots. Some



Fig. 6.—A three-year-old Burton prune graft on apricot stock. Note the splendid growth made by the prune top.

growers, however, are well pleased with results from grafting Clyman, French, Giant, Kelsey, Satsuma, Sugar, Tragedy, Wickson, Quackenboss, Imperial, and Standard on the apricot. It should be mentioned, however, that only rarely are any of the plums as satisfactory on the apricot as on some of the other stocks. In fact, it is questionable

whether the prunes should be placed in the list above because of the poor results given in many cases when they were top-worked on apricots. However, there are many cases where the Imperial and French prunes have given splendid results on the apricot, despite the fact that extreme care had to be exercised in supporting the grafts during the first few years. In practically every instance the prune has outgrown the apricot, forming a rather large constriction at the union. The Burton prune has given about the same results as the



Fig. 7.—When prunes are topworked on apricots the prune top generally outgrows the apricot at the point of union. However, this does not seem to affect the top growth in any manner whatever.

Imperial and French. Although a constriction is evident, the prune top is making satisfactory growth where top-worked on the Royal apricot and as yet no breakage has occurred (figs. 6 and 7).

*Plums as Stocks for Peaches, Apricots, Almonds, and Myrobalan Plum Seedlings.*—Although many varieties of plums have been grafted on such fruits as peaches, apricots, almonds, and Myrobalan plum seedlings, a considerable amount of top-working has also been practiced with these various fruits on standard varieties of plums. The results of such attempts can be dismissed by the statement that peaches and almonds generally fail to grow on plums, that apricots have not been successful to any extent where tried, and that the Myrobalan plum seems to thrive well, particularly on the European types.

CHART SHOWING BEHAVIOR OF SEVERAL VARIETIES OF PLUMS AND PRUNES WHEN TOP-WORKED ON OTHER VARIETIES\*

Stock	Scion	Apex	Beauty	Burbank	Burton	California Blue	Climax	Clyman	Diamond	Duarte	Formosa	French	Gaviota	Giant	Grand Duke	Hungarian	Imperial	Kelsey	President	Quackenboss	Robe de Sergeant	Santa Rosa	Satsuma	Standard	Sugar	Tragedy	Wickson
Apex	X																										
Beauty	S	X																									
Burbank	S	D	X																								
Burton	U																										
California Blue	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Climax	S	S	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Clyman	S	S	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Diamond	S	S	D	S	D	D	S	X	U	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Duarte	S	S	D	S	D	D	S	X	U	X	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Formosa	S	S	S	D	D	D	S	X	U	X	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
French	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Gaviota	D	D	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Giant	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Grand Duke	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hungarian	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Imperial	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U
Kelsey	D	D	U	U	U	U	U	U	U	U	U	U	U	U	U	U	X	X	U	U	U	U	U	U	U	U	U
President	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Quackenboss	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Robe de Sergeant	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Santa Rosa	S	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	X	X	X	X	X	X	X
Satsuma	S	S	S	S	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	S	S	S	S	S	S	S	S
Standard	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sugar	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tragedy	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Wickson	X																										

Explanation of Chart:

S—Satisfactory combination.

U—Unsatisfactory combination.

D—Doubtful combination.

X—Scion on own stock.

\* Blank spaces indicate sufficient data not available.



### SUMMARY

1. Three factors are responsible for the large amount of grafting which has been practiced with plums during recent years. These factors are: (a) Effort to decrease the number of varieties. (b) Necessity of changing over to varieties better adapted to local conditions. (c) Importance of mixture of varieties in the same orchard to effect pollination.

2. The large amount of fruit tree grafting that has been practiced in California has brought to light much information concerning affinities between different varieties and between different species of fruit.

3. Peaches and almonds generally fail to grow well when grafted on plums.

4. None of the European varieties of plums is successful when grafted on the Japanese types. On the other hand, many of the Japanese types can be grafted successfully on most of the European varieties.

5. The California Blue has proved to be a failure in nearly every case where it has been used either for stock or scion purposes in top-working.

6. Clyman, Diamond, French prune, Giant, Sugar prune, and Tragedy prune make excellent stocks for all other varieties worked on them except the California Blue.

7. The peach tree makes a good stock for practically all Japanese plums but not for all European types.

8. Certain varieties of plums can be grafted successfully on some almond trees while others cannot.

9. Only a few varieties of plums appear to do well when grafted on apricot trees.

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